

PATENT COOPERATION TREATY

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From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/B2005/050901

International filing date (day/month/year)
15.03.2005

Priority date (day/month/year)
26.03.2004

International Patent Classification (IPC) or both national classification and IPC
G09G3/34

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/050901

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/050901

Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-14, 17
	No: Claims	1, 2, 15, 16
Inventive step (IS)	Yes: Claims	3-9, 11
	No: Claims	1, 2, 10, 12-17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	-

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050901

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: US2002/0130830

D2: EP0513551

2. Independent claims.

2.1. Novelty.

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 15 is not new in the sense of Article 33(2) PCT.

Claim 1.

The document D1 is regarded as being the closest prior art and discloses (references to D1 and comments between parentheses):

A display device comprising:

- ▶ **an adjustable light source** (fig.1: backlight unit 120 driven by the inverter 500),
- ▶ **a display panel with display pixels for modulating light originating from the light source** (LCD display panel 110, see fig.1 and paragraphs 23-24)
- ▶ **and processing circuitry coupled to the display panel and the light source** (timing controller 200, see fig.1 and paragraphs 26-28) ,

the processing circuitry having an input for receiving an input signal representing gray levels of pixels of an image to be displayed on the display panel (inputs RGB connected to data counter 210, see fig.1 and paragraph 29) and comprising:

- ▶ **means for selecting a dimmed brightness level of the light source in dependence on the gray levels of the image pixels** (the number of low and high gray levels are counted for the purpose of having an action on the luminance, see fig.3 steps x10 and paragraphs 30-35), and
- ▶ **means for adapting the input signal in dependence on the dimmed brightness level** (data conversion, see paragraph 36 and steps x20 of fig.3).

Claim 15.

The subject-matter of claim 15 corresponds in method steps to the subject-matter of claim 1. The reasoning given for claim 1 applies, mutatis mutandis, to claim 15. The subject-matter of claim 15 is therefore not new.

2.2. Inventive step.

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 is not inventive in the sense of Article 33(3) PCT.

Claim 17.

- ▶ the features of claim 17 corresponding to page 17/lines 27-31 (claims sheets) are known from D1 (see fig.1 of D1: input signal RGB, LC display panel 110, an adjustable backlight 120).
- ▶ the features of claim 17 corresponding to page 17/line 32 to page 18/line 2 (claims sheets) are also known from D1 (see reasoning given for claim 1).

The skilled person would, according to circumstances, integrate the features of claim 17, in an integrated circuit, without exercise of inventive skill, when confronted with the problem of space saving.

3. Dependent claims.

Dependent claims 2, 10, 12, 13, 14 and 16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

Claim 2.

- ▶ Claim 2 is not clear as such because the relation between the grey level and the brightness level is not mentioned (Art.6 PCT).
- ▶ The "or" operator renders the additional subject-matter of claim 2 known from D1 because the backlight brightness, in D1, is adjusted (dimmed) depending on a number of grey levels below the predetermined level of 32/64 as referred to fig.2 of D1 (see also fig.3 of D1).

This predetermined level of 32/64 implicitly corresponds to a predetermined brightness

level of the backlight.

Claim 10 and additional remark about claim 2.

The subject-matter of claim 2 does also not meet the requirements of PCT with respect to inventive step (Art.33(3) EPC) because just considering the number of grey levels above or below a threshold is already known from D1 (see fig.2 and fig.3 of D1) and as the relationship between grey levels and brightness levels remains unclear in claims 2 and 10, no distinctive technical features can be identified.

Claim 12.

In the field of displays, using the information of previous images is a known technique used for a plurality of reasons like movement estimation, response time improvement, image error calculation, etc...

For example, the apparatus of D2 adjusts the new brightness level in accordance with the previous one (see the abstract).

Therefore, when confronted with the problem of smoothing the brightness response to the user's eyes, the skilled person would, according to circumstances, counterbalance the new dimmed brightness value with previous ones without exercise of inventive skill.

Claim 13:

Similar to the reasoning given for claim 12, when confronted with the problem of increasing the response time for implementing a new dimmed brightness level, the skilled person would, according to circumstances, reduce the counterbalancing effect of previous dimmed brightness levels without exercise of inventive skill.

Claim 14

Starting from D1, when confronted with the problem of not distorting the image processing due to black bars or any other external signs, the skilled person would process only the useful portion of the image, according to circumstances, without exercise of inventive skill.

Claim 16.

D1 discloses a graphic controller (ref.900 of fig.1) -corresponding to the signal processing circuitry of claim 16- providing the input image signal.

The subject-matter of claim 16 is therefore not new.

4. Other dependent claims.

The subject-matter of claim 3 meets the requirements of the PCT with respect to novelty and inventive step (Art. 33(2) and 33(3) PCT).

Claim 3.

The subject-matter of claim 3 differs from the disclosure of D1 in that, in D1, no error optimization with regard to the upper and/or lower grey levels is performed.

Starting from D1, when confronted with the problem of displaying the maximum number of grey levels of the input image, the skilled person would first consider to increase the number of possible brightness levels as referred to in fig.3 of D1 (example: 8 brightness levels instead of the 4 existing ones).

He would not obviously consider to calculate the dimmed brightness level according to a function minimizing the number of grey levels that will not be displayed because of the limited contrast ratio of the display panel.

Additional comment on claim 3: the limited contrast ratio of the display panel appears to be the only reason why the dimmed brightness level and the predetermined brightness level have been claimed.

Therefore, as the invention seems to lie in claim 3, this feature appears to be essential for the definition of the subject-matter of claim 3.

Claims 4-9 and 11.

Claims 4-9 and 11 depend directly or indirectly on claim 3. Their subject-matter also meets the requirements of the PCT with respect to novelty and inventive step (Art. 33(2) and 33(3) PCT).